Vulcanism and Prehistory in the massif central of France : Future Prospects for Sustainable Development of Rural Highlands

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VULCANISM AND PREHISTORY IN THE MASSIF CENTRAL OF FRANCE : FUTURE PROSPECTS FOR SUSTAINABLE DEVELOPMENT OF RURAL HIGHLANDS.

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Abstract

Among the Massif Central, two areas are well known for their volcanic activity and their rich prehistoric heritage: The Grande Limagne, at foothill of The Chaîne des Puys, where vulcanism interfered with human settlements, and the Velay with its huge basaltic fissural eruptions and its numerous phreatomagmatic features which determine specific landscapes.

In the Grande Limagne, Late Glacial and Holocene volcanic activity of the Chaîne des Puys had a severe impact on the plain evolution. An important phase of trachy-andesitic activity was followed by several trachytic volcanic eruptions. Between the Older Dryas and the Atlantic Period, at least ten major pyroclastic formations affected the plain of the Limagne d'Auvergne and they have been preserved in various depositional contexts. Their ejections contributed to the fill of the Limagne hollows and greatly disturbed the regular evolution of these. The volcanic events are useful isochronic markers that have helped construct a

detailed tephrostratigraphic framework and their impact on the botanical environment has also been quantified. Archaeological investigations demonstrate that a few Magdalenian and Mesolithic sites were directly affected by tephra falls. For example Les Roches Tephra reached Abri Durif at Enval, 30 km to the southeast of its source which was Puy de la Nugère; the Marsat syneruptive mud-flow extended 11 km from it's volcano source, Puy Chopine, and covered an epipaleolithic site on the edge of the Limagne plain; the CF7 Tephra, represented by centimetric angular fragments of trachyte noticed in several sections studied to the North-east, East and South of Clermont-Ferrand, resulted from the explosion of a trachytic dome affecting a Sauveterrian camp. Archaeologists must now determine the precise consequences of the stress on the economy of the successive prehistoric groups who were directly affected by this volcanic activity.

In Velay, fissuration and columnar jointing of basaltic lava flows played an active morphologic role during alteration and erosion. They widely control the evolution of basalt cliffs and the development of rock shelters under pleistocene periglacial climates. Maar lakes and caves of the hyaloclastic pipes of Le Puy area were attractive sites for prehistoric groups too. A wide range of volcanic rocks (basalts, trachy-phonolites) and hydrothermal silica were extensively used to manufacture stone tools during Middle Palaeolithic and various artefacts (lamps, engraved pebbles) as well. No tephra layers have been discovered in archaeological layers of Haute-Loire even if volcanoes were active in Ardèche during the Upper Pleistocene. However, Lower and Middle Pleistocene vulcanism has determined lanscape characteristics which strictly control Middle and Upper palaeolithic settlements.

If recent huge projects in Auvergne, as *Vulcania* near Clermont-Ferrand for example, try to use vulcanism as a matter of sustainable local development, attracting either seasonal touristic flow or all-year academic activities, the remote highlands of Velay begin to discover that archaeology and vulcanism make an original combination to increase interest of populations and can be a key for sustainable rural development. The project *Archéo-Logis*, based in a small village of the upper Loire gorges and managed with the help of the european program LEADER II, is a good start in this new direction which is strongly supported by the Département of Haute-Loire since 1997.